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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/585,192	06/01/2000	Charles L. Zahm	GEH-01-060	4926

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06/30/2003

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EXAMINER

BROADHEAD, BRIAN J

ART UNIT

PAPER NUMBER

3661

DATE MAILED: 06/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/585,192

Applicant(s)

ZAHM ET AL.

Examiner

Brian J. Broadhead

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 2, 3, 4, 5, 12, 13, 14, 30, 15, 16, 17, 18, 19, 28, 29, and 31 rejected under 35 U.S.C. 103(a) as being unpatentable over Bruckner, 6266582, in view of Hawthorne, 6263266.

2. As per claims 1, 2, 3, 5, 12, 13, 14, 30, 15, 16, 17, 19, 28, 29, and 31, Bruckner discloses providing at least two satellite signal receivers on the vehicle at spaced locations along the length of the vehicle in figure 4; determining a set of phase differences between satellite reference signals received by satellite receivers on lines 15-30, on column 4; determining an accurate heading of the vehicle using the set of phase differences between the satellite reference signals, whereby the heading represents the direction of travel of the vehicle and which end of the locomotive is in the lead in the direction of travel on lines 1 through 24, on column 3; determining a vector distance between the two antennas and using the equations in the claims on lines 18-30, on column 4; determining heading rate by the equation in the claims on lines 1-15, on column 3;

3. Bruckner does not disclose the vehicle is a locomotive; determining track curvature; access a database of track heading and grade to determine a present track heading and grade at the determined position of the locomotive; sample the latitude and longitude of the locomotive and determine the distance traveled by the locomotive; and using the equations of the claims to determine the distance traveled.

4. Hawthorne teaches the vehicle is a locomotive in figure 1; determining track curvature on lines 25-45, on column 9; access a database of track heading and grade to determine a present track heading and grade at the determined position of the locomotive on lines 25-45, on column 9; sample the latitude and longitude of the locomotive and determine the distance traveled by the locomotive on lines 35-38, on column 10; and using the equations of the claims to determine the distance traveled on lines 28-45, on column 9, this is inherent in all GPS systems that measure distance. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the GPS system of Bruckner with Hawthorne because such modification would provide for a locomotive system that can eliminate the need for redundant inertial or dead reckoning measurement systems.

5. As per claims 4 and 18, Bruckner and Hawthorne disclose the limitations as set forth above. Bruckner and Hawthorne do not disclose determining the heading according to the equation in the claims. This is a design choice since it depends on the placement of the antennas as to whether the claimed equation represents the heading. In the positioning of the antennas in Bruckner 90 degrees would need to be added to the heading measurement. It would have been obvious to one of ordinary skill in the art

at the time the invention was made to use the heading equation in the claims because it is a design choice.

2. Claims 10, 11, 24, 25, 26, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruckner, 6266582, in view of Hawthorne, 6263266, as applied to claims 1, 5, 15, and 19 above, and further in view of Kumar, 5896947.

6. Bruckner and Hawthorne disclose all the limitations as set forth above. They do not disclose controlling the dispensing of track lubricant in accordance with track curvature; when the curvature is greater than a predetermined magnitude. Kumar teaches of the dispensing of track lubricant in accordance with track curvature and when the curvature is greater than a predetermined magnitude on columns 1, 2, and in the abstract. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the invention of Kumar with Bruckner and Hawthorne, because such modification would make a track lubrication system that measures track curvature better which would make distributing the correct amount of lubricant easier.

7. Claims 6, 7, 8, 9, 20, 21, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruckner, 6266582, in view of Hawthorne 6263266, as applied above, and further in view of Bidaud, 6347265.

3. Bruckner and Hawthorne do not disclose the track curvature is determined from angular rotation determined from satellite signals and velocity; angular rotation is found from a gyro and vehicle speed from a tachometer; or finding curvature from lateral acceleration and velocity. Bidaud teaches of disclose the track curvature is determined from angular rotation and velocity on lines 20-30, on column 5; angular rotation is found

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from a gyro and vehicle speed from a tachometer on lines 20-30, on column 5; or finding curvature from lateral acceleration and velocity on column 5. Bidaud does not teach determined from angular rotation determined from satellite signals to measure curvature. Bruckner discloses using satellite receivers to replace gyros for measurements. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the curvature finding methods of Bidaud in the invention of Bruckner and Hawthorne et al. because such modification would allow the use of both satellite signals and inertial sensors to both measure the same values and act as redundant systems, or to use both systems to improve accuracy of both measurements.

Response to Arguments

8. Applicant's arguments filed 4-15-03 have been fully considered but they are not persuasive. Applicant's first argument with respect to an airplane only flying in one direction is not convincing because Bruckner discloses the system can be used on other vehicles, and aircraft moves in reverse when moving on the ground at an airport. Also, the argument that Hawthorne does not disclose an inertial measurement system is not convincing because Hawthorne does use dead reckoning sensors to measure heading and using the system of Bruckner would provide a backup to these sensors without the need for addition dead reckoning sensors. Bruckner also discloses the need for redundant sensor systems on lines 50-65, on column 1, and that an inexpensive option for back up attitude and heading reference systems is the dual GPS system. This would be even more attractive on Hawthorne since GPS is already present. Applicant's argument with respect to Bruckner and Hawthorne teaching away from each other is not

convincing. Applicant states that Bruckner discloses three orthogonal axes and roll, pitch and yaw information. Applicant seems to be confusing attitude with heading. Change in attitude is used to find heading. Successive values of attitude and position of the antennas would be used to determine heading.

9. In response to applicant's arguments, the recitation of detecting track wear and reducing track wear in claim 15 has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

10. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Broadhead whose telephone number is 703-308-9033. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William A. Cuchlinski can be reached on 703-308-3873. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

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BJB
June 27, 2003

A handwritten signature in black ink, appearing to read 'W.A. Cuchlinski, Jr.', written in a cursive style.

WILLIAM A. CUCHLINSKI, JR.
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600